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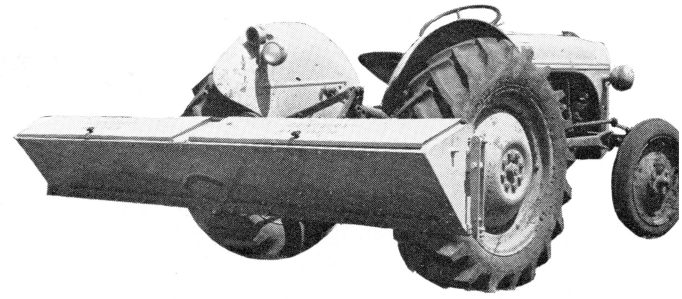
a new idea for

SEEDING GRASS-LEGUME MIXTURES



Grain drills do a better job of seeding, but also cost more than endgate seeders. Now, with the development of relatively low-cost single-hopper general-purpose seeders, there's a new possibility for seeding mixtures.

by Dale O. Hull and Maurice L. Clark

THE "average" Iowa farmer seeds only about 13 percent of his cropland to forage crops each year, according to the 1950 census. He plants about 50 percent of his cropland with corn. If you come anywhere near these percentages and with grain drills costing considerably more than endgate seeders, it's not too surprising that you may hesitate to give up the endgate seeder—even though it gives you uneven forage stands.

Perhaps if your average acreage seeded to forage crops were larger, you'd feel more justified in making the higher investment for a drill. But many farmers, though knowing that the grain drill is a superior seeding machine, decide to get along with the endgate seeder for their relatively small forage acreages.

A New Method . . .

But now, at least two low-cost single-hopper general-purpose seeders have been introduced to the farm trade. They're power-takeoff driven and don't require ground drive wheels, and they're easily mounted on a tractor. One manufacturer provides special mountings so you can assemble your own packer-seeder by mounting the seeder on your corrugated roller or mulcher.

Our observations have been that these seeders do a satisfactory job of sowing both small but heavy legume seeds and fluffy bromegrass seeds.

Research to gain new information about the mechanical phases of crop and livestock production is the main job of agricultural engineers at Iowa State College. Last

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PHOTO 1 (left): In seeding tests, the more fluffy grass seeds were placed in hopper first, finer legume seeds were spread over grass seed and then mixed by hand as shown. PHOTO 2 (right): After thorough mixing, seeder was operated for a short time, and samples of seedings were then taken in sample pans as illustrated to see if ratio of seeds remained about the same as originally mixed.

spring, we tested this new idea for seeding grasses and legumes.

Mix 'Em Up?

To keep down the cost of the new seeding machines and to make them competitive with endgate seeders, the manufacturers have used a single hopper. And to cut down the number of times you'd have to cover the field to seed a grass-legume mixture, the manufacturers suggested hand mixing grass and legume seeds in the hopper—and then seeding the mixture. They maintained that the seeds should stay mixed in the hopper and give a good ratio of legumes to grasses when the stand became established.

When the first of these general-purpose seeders was demonstrated, many of our agricultural engineers were skeptical as to how well the seeds might stay mixed—particularly if the seeder were operated over rough ground. But on the basis of this first commercial demonstration at the college Agricultural Engineering Farm, E. V. Collins, of the Iowa Agricultural Experiment Station, and R. A. Norton, formerly USDA agricultural engineer stationed at Ames, made additional observations of alfalfa-bromegrass mixtures seeded with the single-hopper power-takeoff-operated machine. They reported the ratio of bromegrass to alfalfa seeds sown to be quite satisfactory.

Last spring, using another make of general-purpose seeder, we made some further observations as to the way seed would be distributed if various combinations of grass and legume seed were mixed in the hopper.

The seeder used is shown on page 3. This is a power-takeoff-driven multiple-purpose single-hopper seeder. It will sow various large seeds such as soybeans, small grains, small smooth legumes and fluffy grass seeds.

While the machine studied by Collins used a reciprocating rope in the bottom of the hopper to carry seeds through the metering orifice, the second machine used two reciprocating chains with a constant-pressure seed metering device. There were no rotating agitators in the hopper. From their tests, the manufacturers believed that elimination of the agitators didn't result in separation of the seeds.

Field Testing . . .

We ran field observations when sowing two seed mixtures. The first consisted of 8 pounds of alfalfa seed to 4 pounds of bromegrass—approximately the recommended seeding rate for well-drained soils. The second was more like pasture mixtures, consisting of 3 pounds of alfalfa, 3 pounds of bromegrass, 3 pounds of timothy and 1 pound of ladino clover. Total weight of the first mixture was 24 pounds; the total weight of the second mixture was 90 pounds.

To test seed separation, if any, in the hopper, we made the seeding trials on a very rough field—a pasture in the beef cattle area at the Ankeny Experimental Farm. The field recently had been cleared with a bulldozer and was much rougher than seedbeds prepared for grass-legume plantings.

The more fluffy seeds were placed in the hopper first. Then the finer legume seeds were spread over the grass seed and the two mixed by hand (see photo 1). After thorough mixing, we operated the seeder for a short time before taking samples of the mixture being sown. We counted the seeds caught in the sample pans to find out if the ratios of the various seeds were the same as originally placed in the hopper. The average number of seeds sown per square foot in the seeding trials are shown in the table. (We used rates which probably are higher than you would use in seeding in actual farm practice.)

The Results . . .

Take another look at the table. Notice that the depth of seed in the hopper didn't seem to greatly affect the rate at which the mixture was seeded by the machine we tested. And there appears to be reasonable evidence to support claims that grass-legume seed mixtures—particularly those containing fluffy grass seeds like brome—will not separate in the hopper and can be seeded as a mixture.

With proper precautions, hopper mixing of fluffy bromegrass seed with other grass and legume seeds seems to suggest a practical once-over seeding method for farmers owning a single-hopper machine. But be very careful to mix the grass and legume seeds thoroughly. Weigh the seeds into the hopper to make sure you'll get the right amount of each. Establishment of uniform stands will depend upon sowing a uniform mixture.

Summarized Results Showing Ratio of Bromegrass Seeds to Alfalfa, Timothy and Ladino Clover Seeds as Placed in Hopper and as Seeded Into Sample Pans.

Trial and sample	Depth of seed in hopper (inches)	Rates of seeding (number of seeds per square foot)				Ratios, brome to alfalfa, timothy and ladino in mixture and as seeded					
						Ratio of mixture in hopper			Ratio as seeded		
		Brome	Alfalfa	Timothy	Ladino	Brome to alfalfa	Brome to timothy	Brome to ladino	Brome to alfalfa	Brome to timothy	Brome to ladino
Trial 1											
1	3.5	25.1	56.0	——	——	2.94	——	——	2.23	——	——
2	2.5	27.6	72.6	——	——	2.94	——	——	2.63	——	——
3	1.5	25.0	50.0	——	——	2.94	——	——	2.00	——	——
Trial 2											
4	9.5	19.2	31.3	193.2	68.0	1.47	9.05	1.96	1.63	10.08	3.54
5	7.0	19.8	21.2	118.0	39.6	1.47	9.05	1.96	1.10	5.95	2.00
6	4.5	20.4	26.7	147.3	43.2	1.47	9.05	1.96	1.31	7.23	2.12
7	3.0	21.3	31.3	197.0	52.1	1.47	9.05	1.96	1.47	9.25	2.45